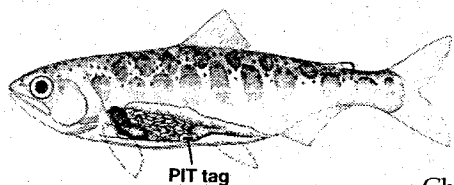
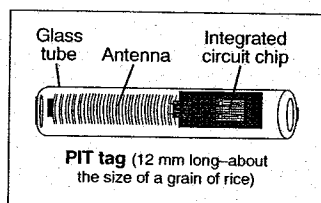


Fish Matters

Opening Day Edition

Ship Canal and Locks to be site of pilot-year study



Residents and boaters along the Lake Washington Ship Canal and near the Ballard Locks may be seeing extra activities in the navigation channel this summer. If a request for funding is successful, starting this month Northwest Fisheries Science Center scientists and their colleagues will be operating a 10-m pontoon barge and outboard-motored skiff to purse-seine and tag up to 1500 juvenile salmon.

Four PIT-tag tunnel readers have already been installed on four flumes at the Hiram M. Chittenden Locks in Ballard. Scientists are calibrating the readers before wild and hatchery PIT-tagged fish that migrate through the Ship Canal arrive at the locks. (A PIT tag is a small electronic device implanted in the body cavity of a fish to allow later identification via detection equipment.)

Scientists will begin weekday seining at the Locks, near the east

side of Gasworks Park, and at other locations along the Ship Canal. NOAA Fisheries is providing the "marking" barge, which was previously used in studies at Lower Granite Dam on the Columbia River. The barge will be operated during purse-seine periods in May and June of this year.

The project is a cooperative study with the U.S. Army Corps of Engineers, Washington Department of Fish and Wildlife, Muckleshoot Tribe, City of Seattle, and King County Metro. Monitoring will be conducted through the year 2002.

"Through this study, we will evaluate various projects that may contribute to restoring ecological functions within the basin," said Fred Goetz of the Corps' Seattle District. "This includes a water conservation study that may yield fish passage improvements at the Locks and in the Canal."



Northwest Fisheries
Science Center

National Marine Fisheries Service

National Oceanic and
Atmospheric Administration

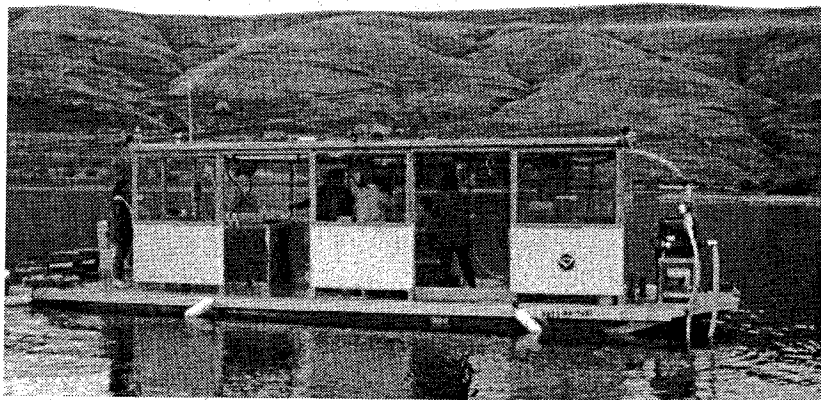
U.S. Department of Commerce

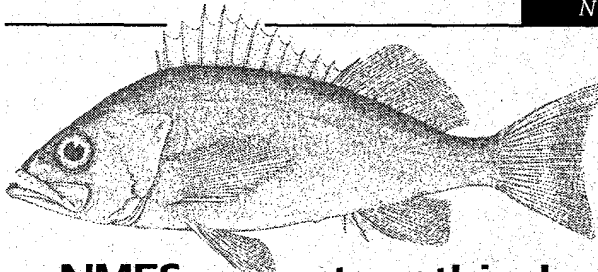
2725 Montlake Boulevard East
Seattle, Washington 98112

Dr. Usha Varanasi
Director

<http://www.nwfsc.noaa.gov>
(206) 860-3200

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NMFS promotes ethical fishing by anglers

Code of Angling Ethics

- Promotes, through education and practice, ethical behavior in the use of aquatic resources
- Values and respects the aquatic environment and all living things in it
- Avoids spilling, and never dumps, any pollutants, such as gasoline and oil, into the aquatic environment
- Disposes of all trash, including worn-out lines, leaders, and hooks, in appropriate containers, and helps to keep fishing sites litter-free
- Takes all precautionary measures necessary to prevent the spread of exotic plants and animals, including live baitfish, into non-native habitats
- Learns and obeys angling and boating regulations, and treats other anglers, boaters, and property owners with courtesy and respect
- Respects property rights, and never trespasses on private lands or waters
- Keeps no more fish than needed for consumption and never wastefully discards fish that are retained
- Practices conservation by carefully handling and releasing alive all fish that are unwanted or prohibited by regulation, as well as other animals that may become hooked or entangled accidentally
- Uses tackle and techniques which minimize harm to fish when engaging in "catch and release" angling

The Northwest Fisheries Science Center's involvement in recreational fisheries

The Northwest Fisheries Science Center, in Seattle, operates under the following broad mandates:

National Recreational Fisheries Coordination Council (NRFCC)

The goal of the NRFCC, created under President Clinton's 1995 Executive Order 12962, is for federal agencies including the Department of Commerce to "improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities."

Department of Commerce (DOC)

DOC's responsibilities include expanding U.S. exports, developing innovative technologies, gathering and disseminating statistical data, measuring economic growth, granting patents, promoting minority entrepreneurship, predicting the weather, and monitoring stewardship.

National Oceanic and Atmospheric Administration (NOAA)

NOAA's mission is to describe and predict changes in the Earth's environment and to conserve and manage wisely the nation's coastal marine resources.

National Marine Fisheries Service (NMFS)

NMFS's mission is to provide stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of the environment. One of NMFS's national objectives is to "eliminate overfishing and rebuild overfished stocks important to commercial, recreational, and subsistence fisheries."

Northwest Fisheries Science Center (NWFSC)

The Center is responsible for providing scientific and technical support for the management, conservation, and development of the Pacific Northwest region's anadromous and marine fishery resources.

Science helps make the most of salmon recovery funds

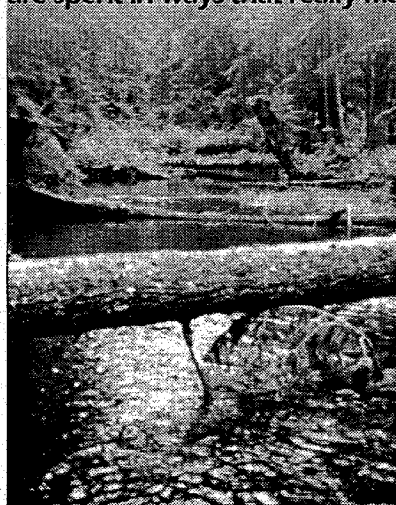
It's common knowledge that Pacific Northwest salmon are endangered. Both the National Marine Fisheries Service (NMFS) and the Northwest Fisheries Science Center (NWFSC) are working hard to help direct recovery efforts so that salmon dollars are spent in ways that really make a difference.

Both NMFS and NWFSC scientists are studying why some habitats have healthier salmon runs than others. Quality freshwater habitat must be available to maintain and restore healthy salmon populations in the Northwest. A decrease in the amount of freshwater habitat available to salmon is a major factor in the decline of many Pacific Northwest (PNW) salmon stocks. There are limited resources available for improving and protecting the freshwater habitat. Conservation and restoration activities must be soundly evaluated and effectively prioritized to make the most of the PNW salmon recovery planning. By effectively prioritizing freshwater habitat projects, we can focus money and time on those locations and activities that are most likely to provide a measurable increase in salmon populations.

Pacific salmon have a complex life cycle that needs a variety of freshwater habitats; from small mountain tributaries and meandering lowland streams to large, mainstream river channels. Research efforts must focus on these different freshwater habitats in order to effectively prioritize and monitor projects at several geographical scales. Current research within the Watershed Processes Program at NWFSC is addressing these questions at the project, watershed, and regional scales.

Fine-scale research is important for uncovering how particular restoration activities affect salmon populations. This will allow us to determine the potential effectiveness of future projects. "Project evaluations provide an assessment of what restoration techniques work best in which type of stream or river," explained Environmental Conservation Division Director John Stein. "We can see measurable improvements when we match the right restoration strategy to the right location for a particular species. For example, some salmon species respond better than others to pools created by placement of large woody debris in streams," said Stein.

Watershed scale. Watershed and regional scale effects can multiply or mask the effects of small-scale projects. Increased productivity in individual river reaches is not always translated into increased returns over entire watersheds. The question of which areas to preserve or restore at the watershed level requires the monitoring and assessment of large-scale projects. Additionally, the use of mathematical models to integrate management effects over large spatial scales is also beneficial. For example, by using models, managers and/or scientists can assess the relative benefits of various riparian treatments for different types and sizes of river channels.



Regional scale. At the largest scale, decisions are made on a regional basis. Key questions include: What types of habitat are most critical for salmonid production? Which areas might be most responsive to restoration? Which areas support the majority of salmonid production and should be conservation targets? Answers to these questions are central to recovery planning and key to evaluating the overall benefits of multiple habitat restoration projects. Answers cannot be found by accumulating the results of project-scale research nor can they be assessed within one watershed alone. A true assessment of the value of particular

types of habitat requires investigations over very large spatial scales.

Using long-term records and remotely-sensed data, scientists can assess the relative productivity of particular areas despite year-to-year variability in fish returns. Certain river reaches and habitat types consistently support the majority of the fish production. By quantifying these patterns, scientists can detect basic habitat / productivity relationships. These same techniques can then be used to evaluate the success of various restoration activities in a particular area.

How does this research help?

- Research at the regional scale provides a template describing which types of habitat, if restored, are most likely to produce larger numbers of fish. Research at the watershed scale identifies which geographic areas within the watershed should be prioritized. Finally, research at the project scale identifies where modifications should occur in a particular river reach.
- Research at all three spatial scales provides guidance for future restoration activities by evaluating the success of past decisions. Evaluation of restoration success begins at the project scale by assessing whether a particular activity has improved freshwater habitat and whether salmonid use of that habitat has increased. By evaluating a suite of localized projects at the watershed scale, scientists can determine whether their combined effect has improved fish production in a particular basin.

In short, the research described above provides a methodology for measuring changes in salmon productivity across large spatial scales. This helps develop a foundation for implementing and evaluating regional habitat restoration and conservation. The Center's research provides managers with the critical information they need to prioritize restoration actions.

Who is catching the nation's sportfish and where?

Below is a summary of the nation's recreational finfish catch by major region in 1998.
(Source: National Marine Fisheries Service, July 1999)

	Total number fish caught	Percent of total fish caught	Largest number of fish caught (non-bait fish)	Largest harvest (by weight)
United States	312 million fish	100 percent		
Atlantic and Gulf of Mexico	284 million	91 percent	Atlantic croaker spotted seatrout summer flounder stripped bass bluefish black sea bass	striped bass summer flounder bluefish dolphin red drum spotted seatrout king mackerel
Pacific Coast	28 million fish	9 percent	Pacific (chub) mackerel surf smelt kelp bass Pacific barracuda black rockfish barred sand bass	yellowtail rockfish black rockfish Pacific barracuda lingcod California halibut blue rockfish

